**Wilmington District**

THE GREAT SEAL OF THE STATE OF NORTH CAROLINA
MAY 20 1775
ESSE QUAM VIDERI

# Wilmington Harbor General Reevaluation Report

**Cape Fear River Assembly Annual Meeting**

**May 15, 2008**

Wilmington District

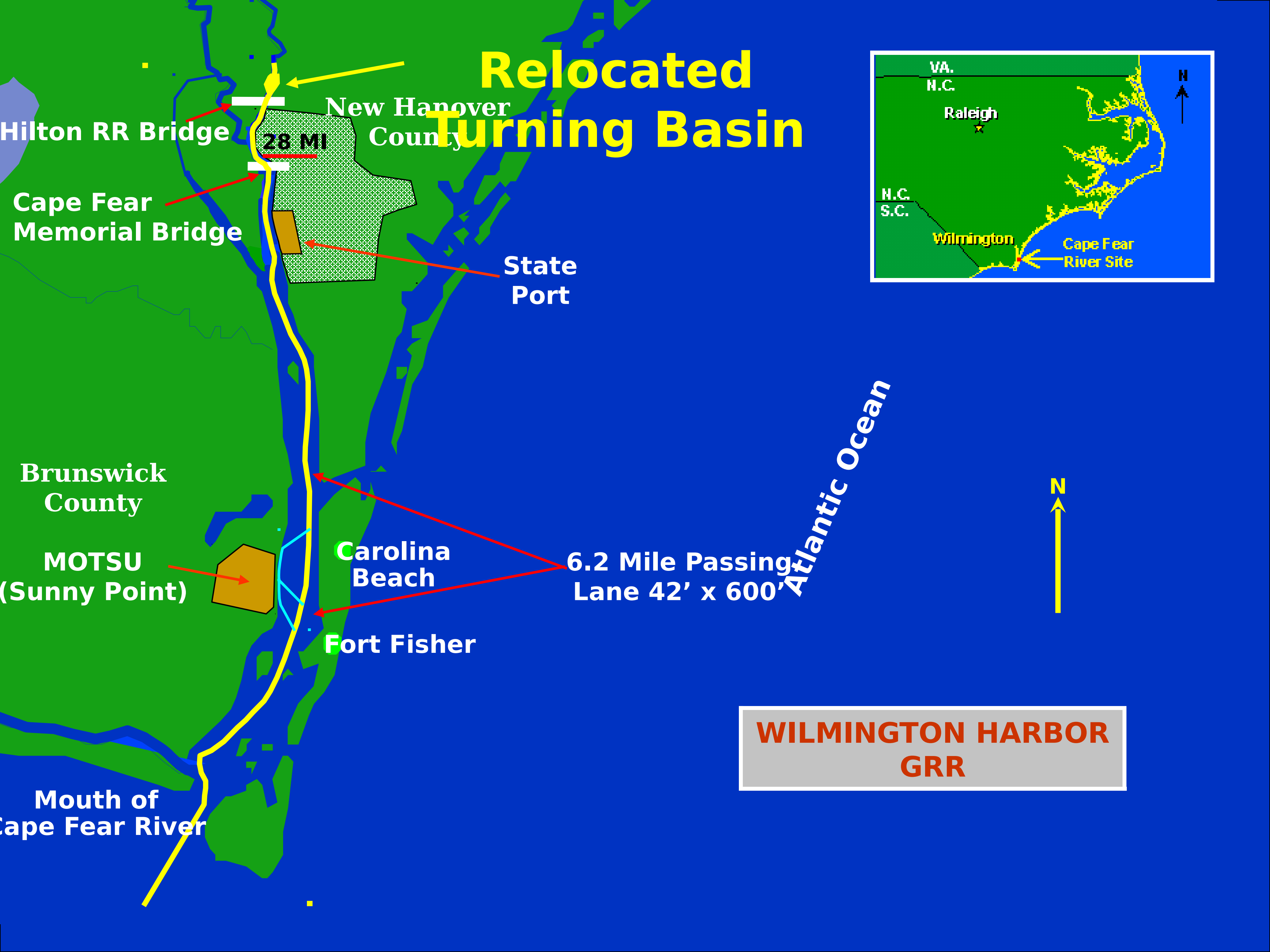
# General Reevaluation Report (GRR)

## Wilmington Harbor GRR

### Components

- **Relocation of a ship turning basin in the NE Cape Fear River**
- **Fish passage at the Ca Locks and Dams**

# Relocated Turning Basin


New Hanover County
Hilton RR Bridge
28 MI
Cape Fear Memorial Bridge
State Port
Brunswick County
MOTSU (Sunny Point)
Carolina Beach
Fort Fisher
6.2 Mile Passing Lane 42’ x 600’
Atlantic Ocean
N
Mouth of Cape Fear River
VA.
N.C.
Raleigh
N
N.C.
S.C.
Wilmington
Cape Fear River Site

**WILMINGTON HARBOR GRR**

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# Relocated Turning Basin

- **Tight squeeze during daylight going bow first**
- **At night, backing stern first even more difficult**

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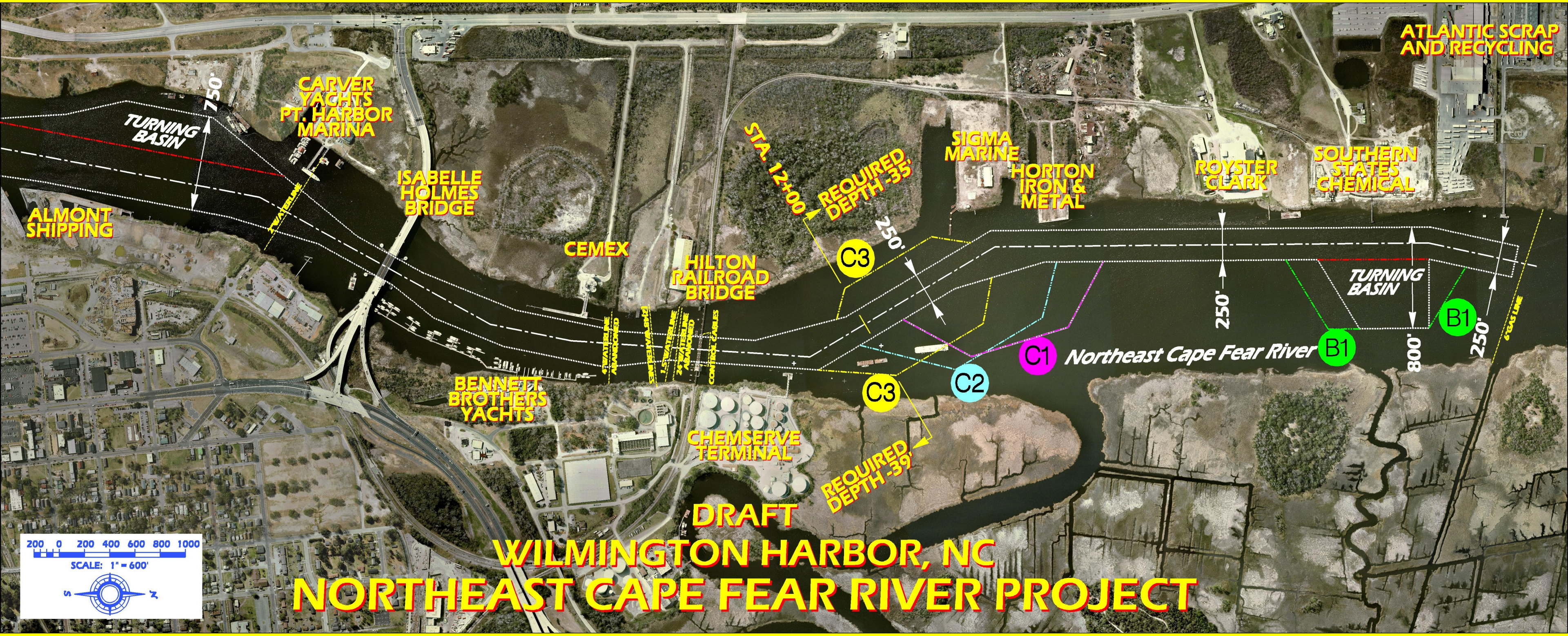
# Relocated Turning Basin Alternatives

## Preferred Basin: C3


ATLANTIC SCRAP AND RECYCLING
CARVER YACHTS PT. HARBOR MARINA
750'
TURNING BASIN
ISABELLE HOLMES BRIDGE
ALMONT SHIPPING
STA. 12+00
REQUIRED DEPTH -35'
250'
SIGMA MARINE
HORTON IRON & METAL
ROYSTER CLARK
SOUTHERN STATES CHEMICAL
CEMEX
HILTON RAILROAD BRIDGE
C3
250'
TURNING BASIN
B1
C1
Northeast Cape Fear River
B1
800'
250'
BENNETT BROTHERS YACHTS
C3
C2
CHEMSERVE TERMINAL
REQUIRED DEPTH -39'
DRAFT
WILMINGTON HARBOR, NC
NORTHEAST CAPE FEAR RIVER PROJECT
200 0 200 400 600 800 1000
SCALE: 1" = 600'
S
N

# Turning Basins Alternatives

- No action – Construct two authorized basins
  - Ships still must pass stern first through the bridges
- C3 preferred by pilots
  - Impacts about 19 acres PNA
  - Total cost less than no action
- C3 selected alternative

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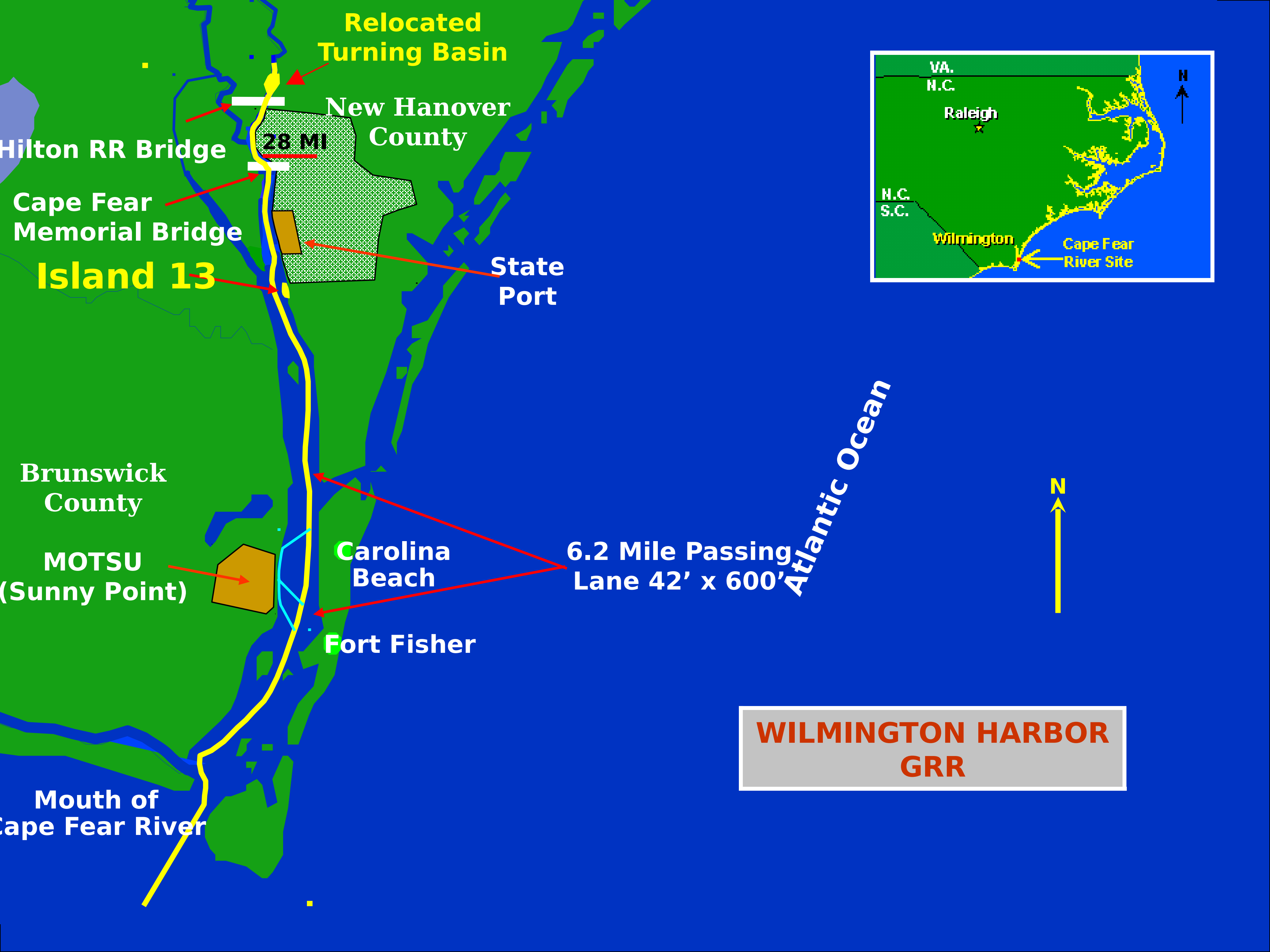
# C3 Turning Basin Mitigation Alternatives

- Restoration
  - Island 13
  - Island 12 – three alternative sizes
  - Alligator Creek
- Fish Passage at the Locks and Dams
  - Lock and Dam # 2, mitigation
  - Lock and Dam # 3, environmental feature
  - Lock and Dam # 1, already required under NMFS BO for blasting in the harbor

# WILMINGTON HARBOR GRR


Relocated Turning Basin
Hilton RR Bridge
New Hanover County
28 MI
Cape Fear Memorial Bridge
Island 13
State Port
Brunswick County
MOTSU (Sunny Point)
Carolina Beach
6.2 Mile Passing Lane 42’ x 600’
Atlantic Ocean
Fort Fisher
Mouth of Cape Fear River
N
VA.
N.C.
Raleigh
N.C.
S.C.
Wilmington
Cape Fear River Site
N

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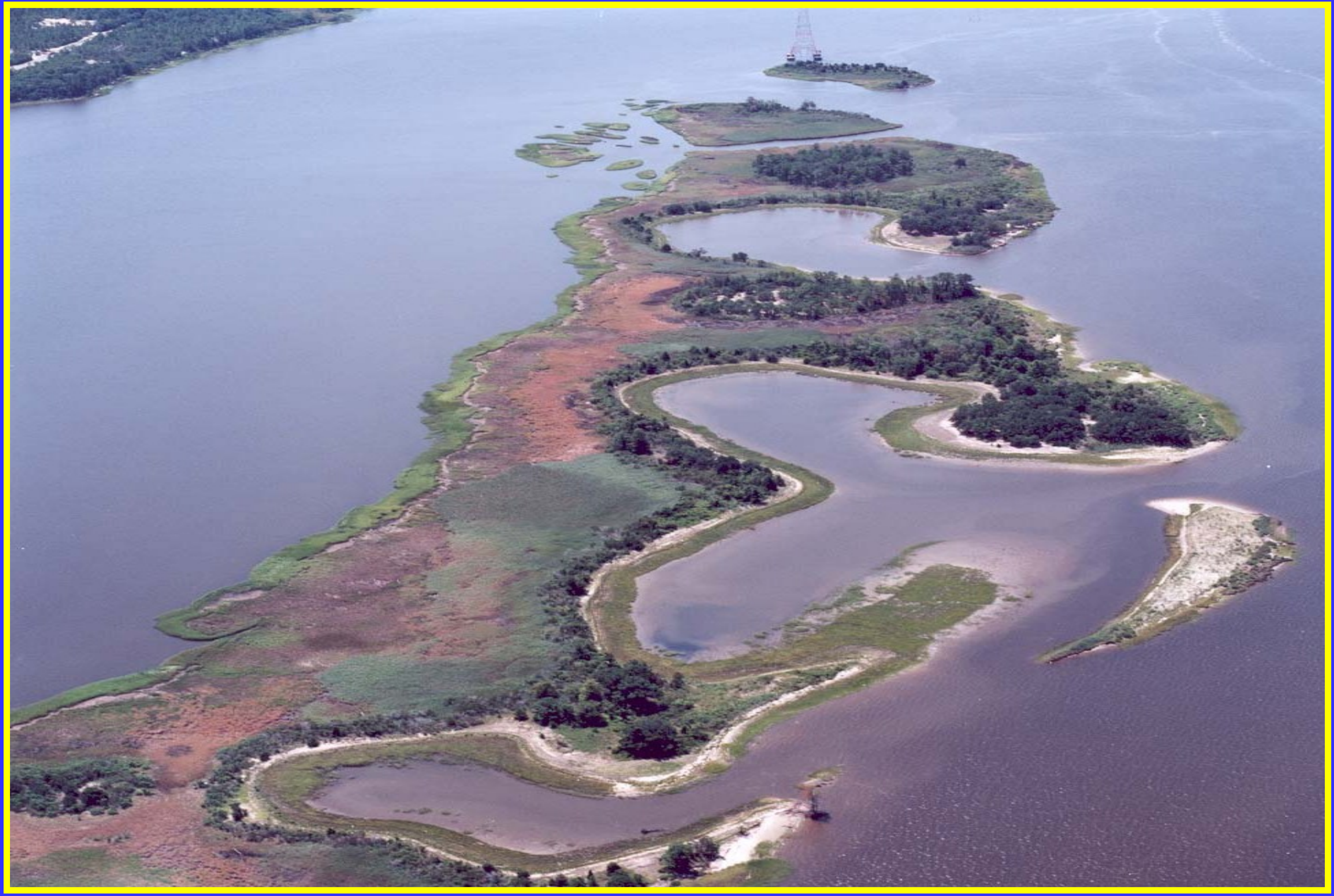
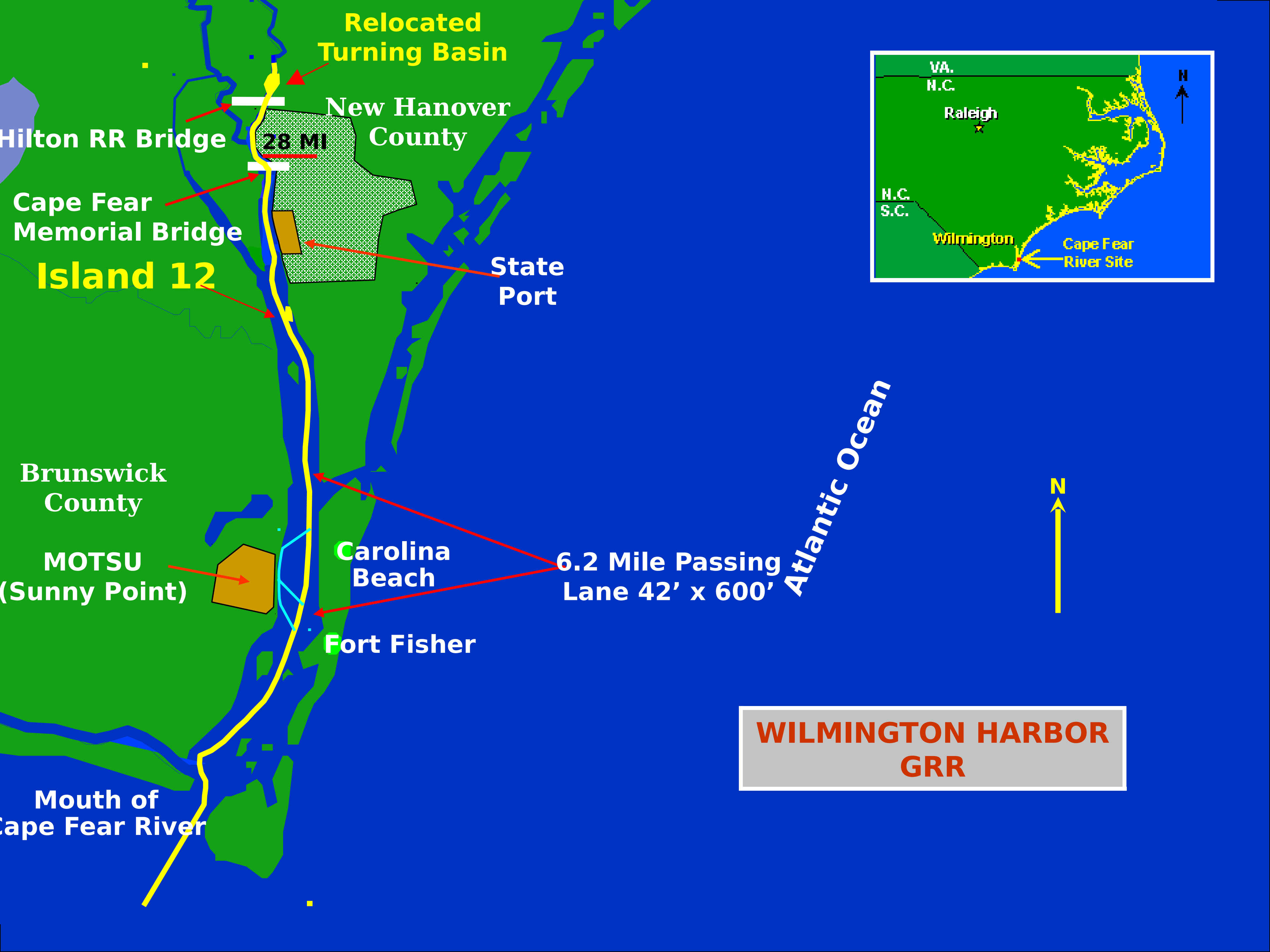
# Relocated Turning Basin

## Mitigation Options, Island 13



# WILMINGTON HARBOR GRR


Relocated Turning Basin
Hilton RR Bridge
28 MI
New Hanover County
Cape Fear Memorial Bridge
Island 12
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N
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S.C.
Wilmington
Cape Fear River Site
N

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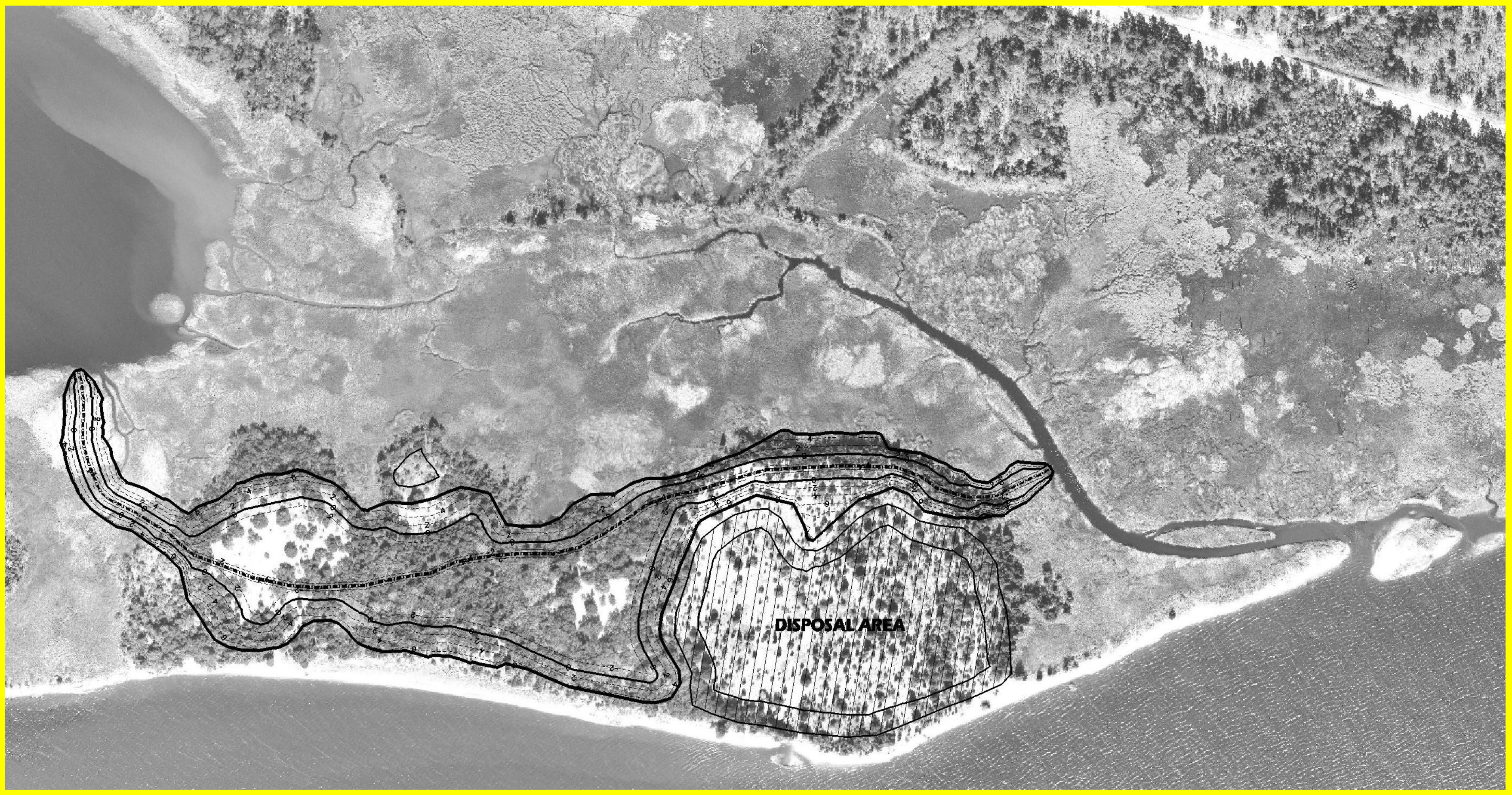
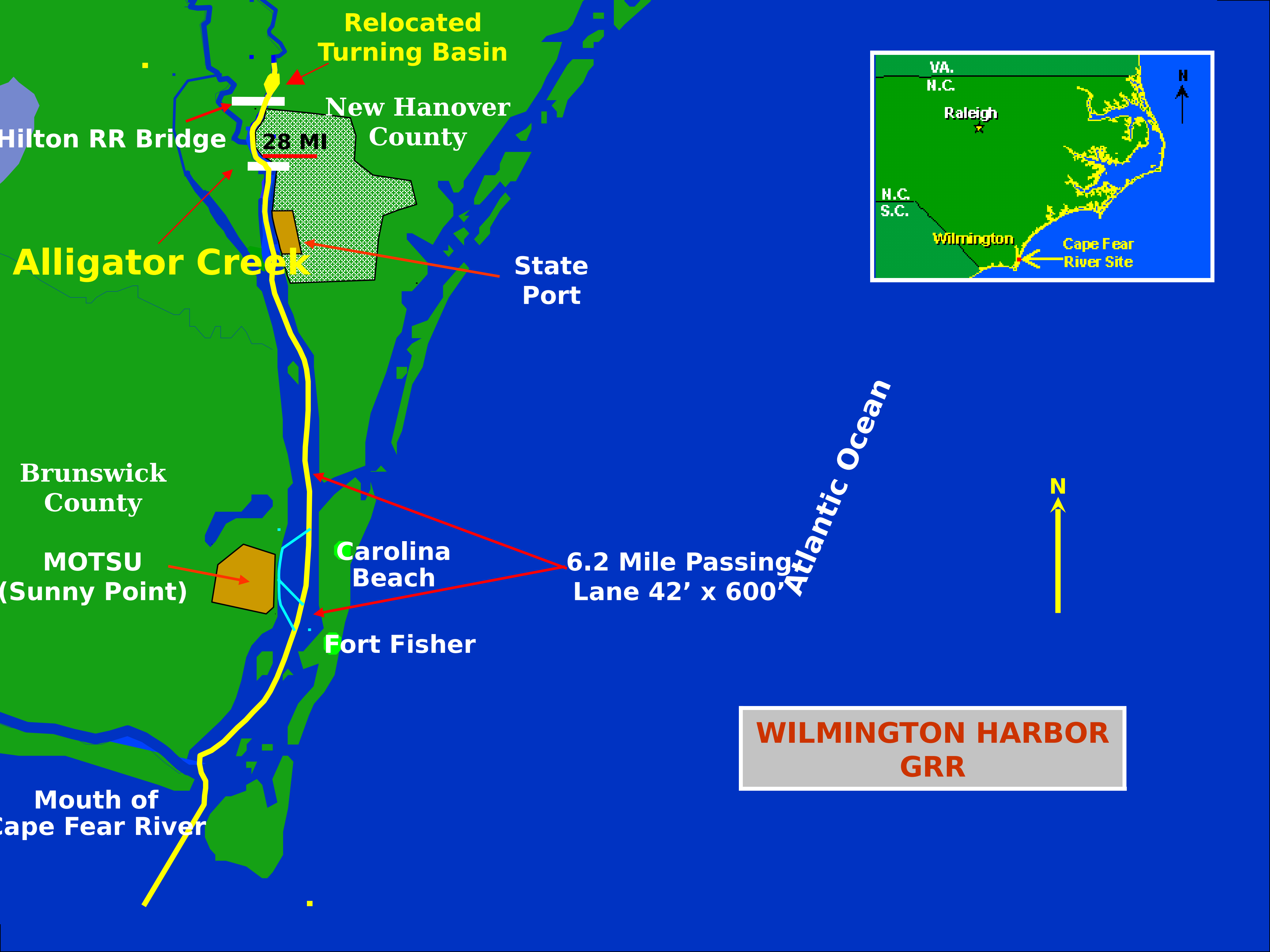
# Relocated Turning Basin

## Mitigation Options, Island 12




Relocated
Turning Basin
New Hanover
County
Hilton RR Bridge
28 MI
Alligator Creek
State
Port
VA.
N.C.
Raleigh
N.C.
S.C.
Wilmington
Cape Fear
River Site
N
Brunswick
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Cape Fear River

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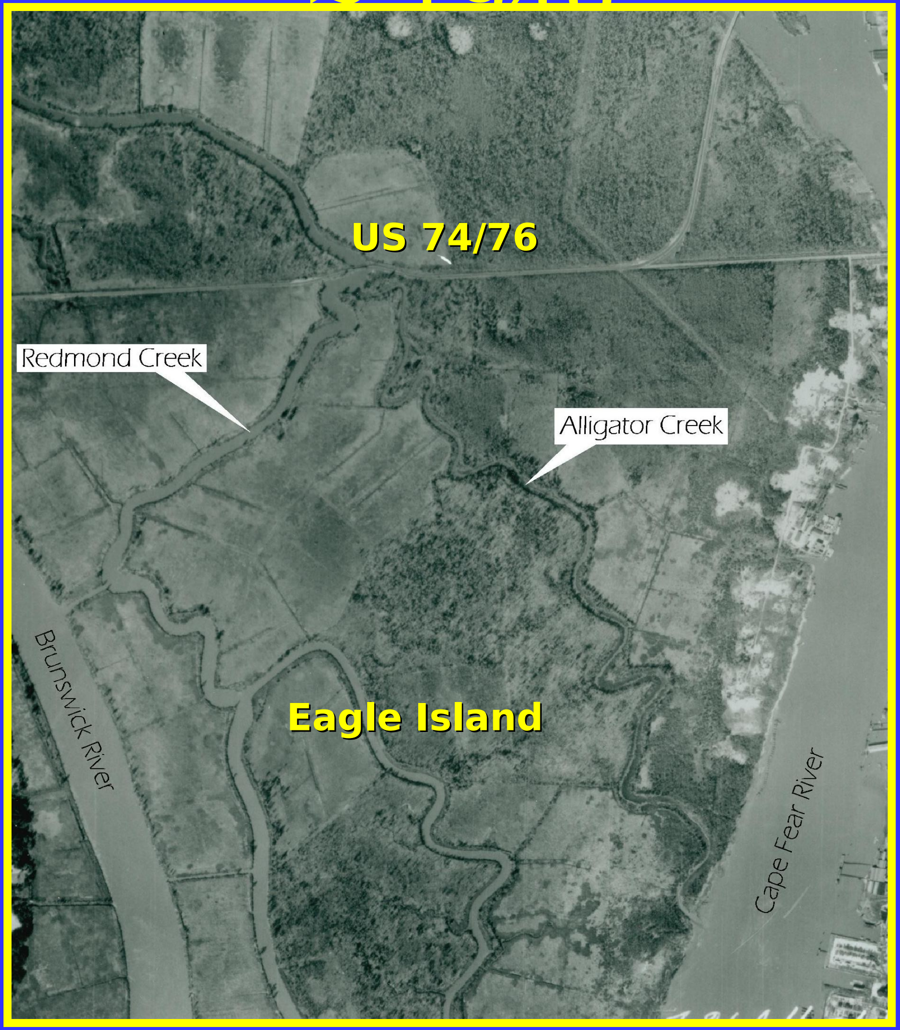
# Relocated Turning Bas

## Mitigation Options, Alligator Creek

## ~ 1940


US 74/76
Redmond Creek
Alligator Creek
Brunswick River
Eagle Island
Cape Fear River

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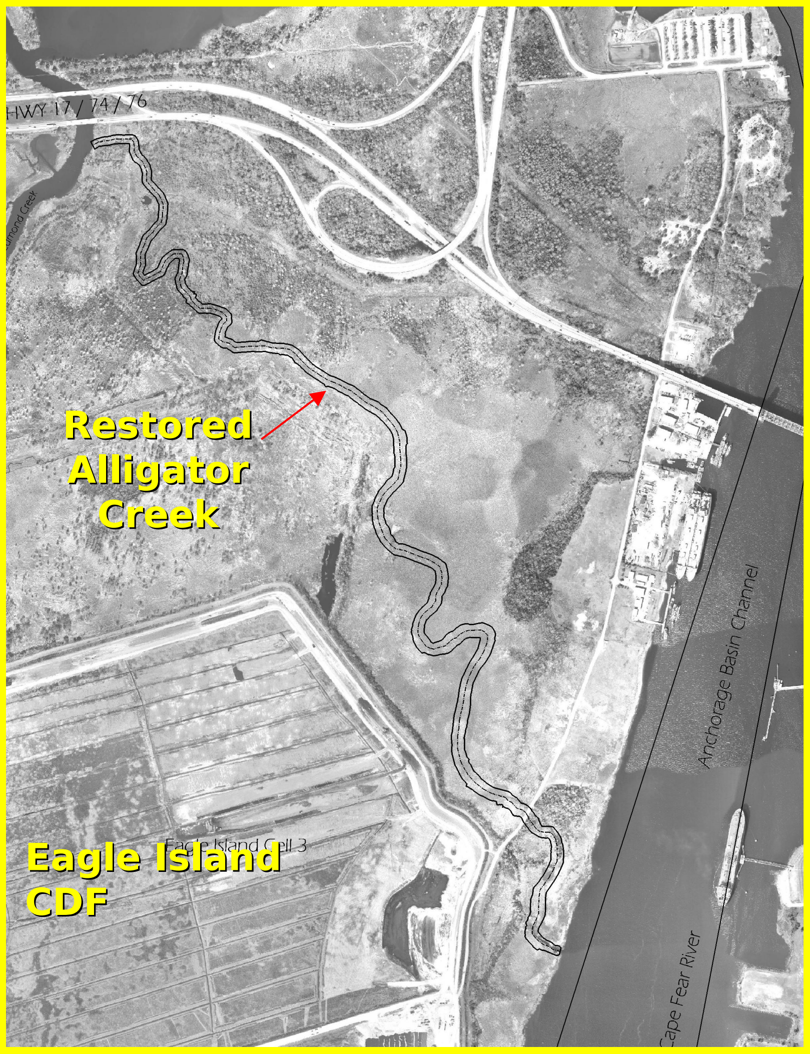
# Relocated Turning Bas Mitigation Options, Alligator Creek


HWY 17 / 74 / 76
mond Creek
Restored Alligator Creek
Eagle Island CDF
Eagle Island Cell 3
Anchorage Basin Channel
Cape Fear River

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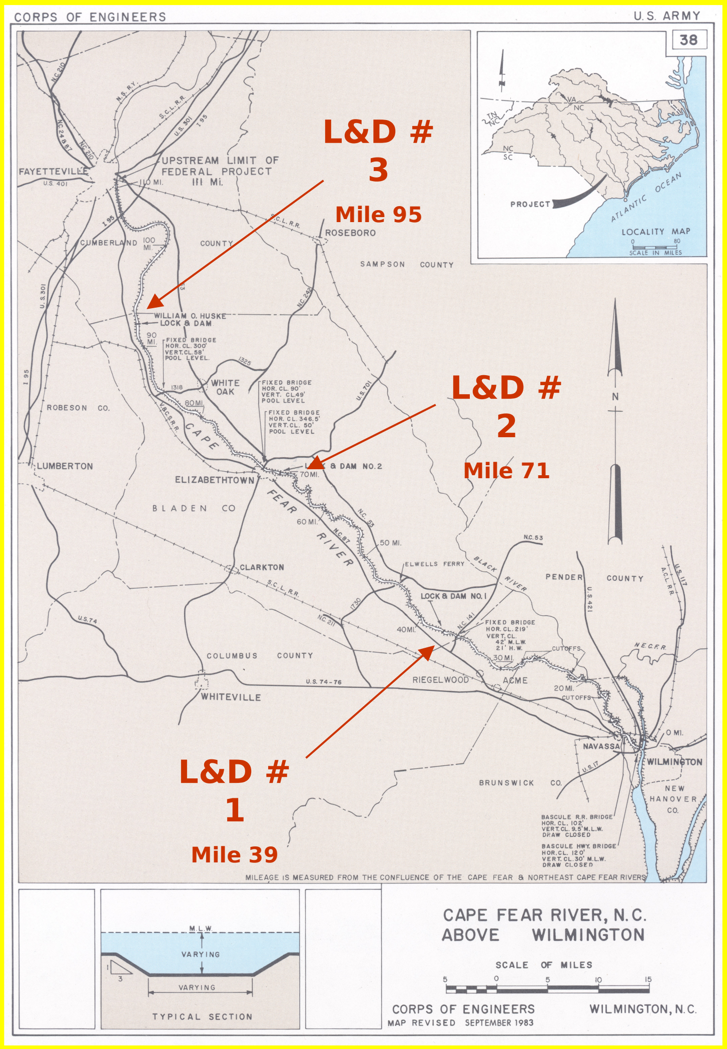
# Cape Fear River Lock and Dams


CORPS OF ENGINEERS
U.S. ARMY
38
FAYETTEVILLE
U.S. 401
N.C. 210
N.C. 24 & 87
N.S. RY.
S.C.L. R.R.
U.S. 301
I 95
UPSTREAM LIMIT OF FEDERAL PROJECT 111 Mi.
110 MI.
CUMBERLAND COUNTY
100 MI.
ROSEBORO
SAMPSON COUNTY
N.C. 242
WILLIAM O. HUSKE LOCK & DAM
90 MI.
FIXED BRIDGE HOR. CL. 300' VERT. CL. 58' POOL LEVEL.
1325
1318
WHITE OAK
FIXED BRIDGE HOR. CL. 90' VERT. CL. 49' POOL LEVEL
FIXED BRIDGE HOR. CL. 346.5' VERT. CL. 50' POOL LEVEL
U.S. 701
ROBESON CO.
80 MI.
V.&C.S. R.R.
CAPE FEAR RIVER
LUMBERTON
ELIZABETHTOWN
LOCK & DAM NO. 2
70 MI.
BLADEN CO
60 MI.
N.C. 53
N.C. 87
50 MI.
CLARKTON
S.C.L. R.R.
ELWELLS FERRY
BLACK RIVER
N.C. 53
PENDER COUNTY
LOCK & DAM NO. 1
1730
N.C. 211
40 MI.
N.C. 141
FIXED BRIDGE HOR. CL. 219' VERT. CL. 42' M.L.W. 21' H.W.
CUTOFFS
30 MI.
U.S. 421
A.C.L. R.R.
U.S. 117
N.E.C.F.R.
COLUMBUS COUNTY
U.S. 74-76
RIEGELWOOD
ACME
20 MI.
CUTOFFS
WHITEVILLE
0 MI.
NAVASSA
WILMINGTON
U.S. 17
BRUNSWICK CO.
NEW HANOVER CO.
BASCULE R.R. BRIDGE HOR. CL. 102' VERT. CL. 9.5' M.L.W. DRAW CLOSED
BASCULE HWY. BRIDGE HOR. CL. 120' VERT. CL. 30' M.L.W. DRAW CLOSED
MILEAGE IS MEASURED FROM THE CONFLUENCE OF THE CAPE FEAR & NORTHEAST CAPE FEAR RIVERS
N
TN NC
VA NC
NC SC
PROJECT
ATLANTIC OCEAN
LOCALITY MAP
0 80
SCALE IN MILES
M.L.W.
VARYING
1 3
VARYING
TYPICAL SECTION
CAPE FEAR RIVER, N.C. ABOVE WILMINGTON
SCALE OF MILES
5 0 5 10 15
CORPS OF ENGINEERS
MAP REVISED SEPTEMBER 1983
WILMINGTON, N.C.

**L&D # 3**

**Mile 95**

**L&D # 2**

**Mile 71**

**L&D # 1**

**Mile 39**

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# Relocated Turning Bas

## Mitigation Options, Fish Passage
## Cape Fear River Locks and Dams

**Lock and Dam # 2**

**Lock and Dam # 3**

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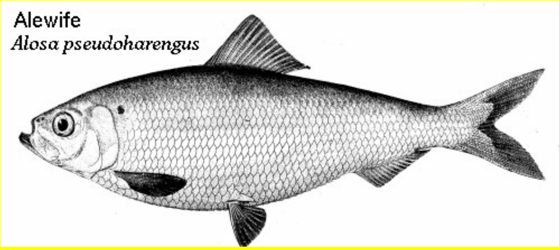
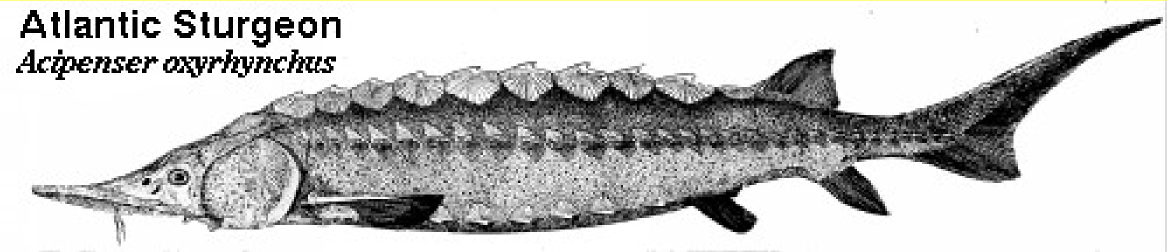
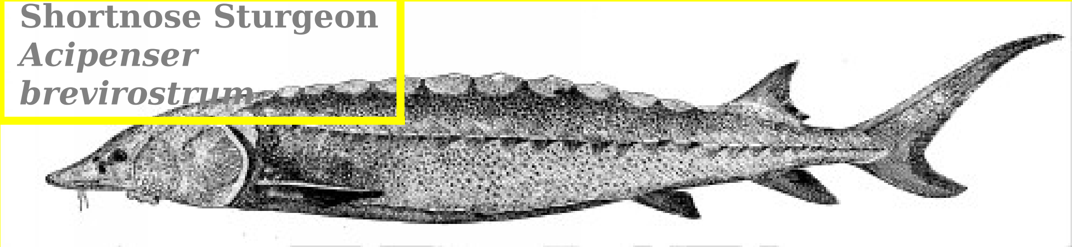
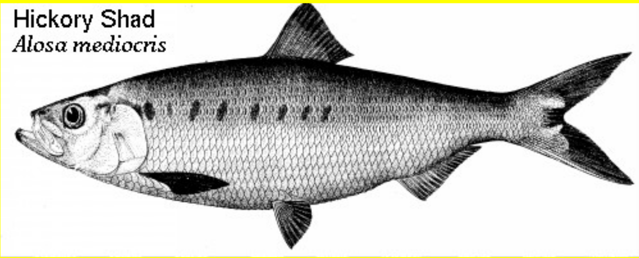
# North Carolina Anadromous Fish

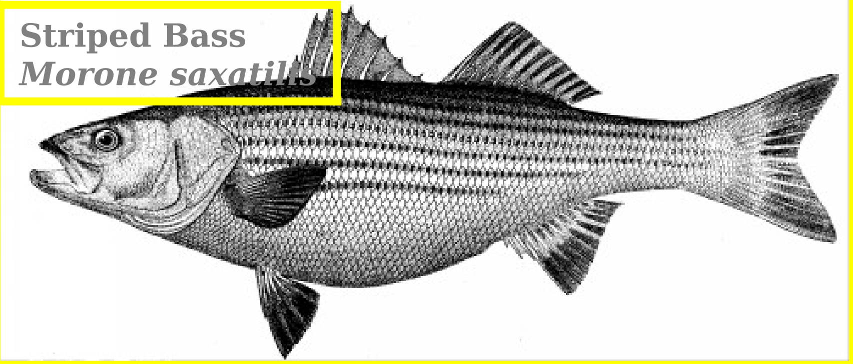
MAY 20 1775

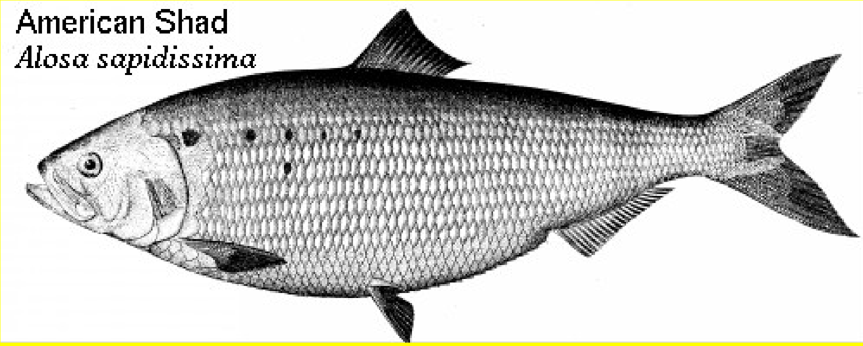

Alewife
*Alosa pseudoharengus*


Atlantic Sturgeon
*Acipenser oxyrhynchus*


**Shortnose Sturgeon**
***Acipenser brevirostrum***


Hickory Shad
*Alosa mediocris*


**Striped Bass**
***Morone saxatilis***


American Shad
*Alosa sapidissima*

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# Fish Passage Considerations

- No commercial traffic
- Operations costs about $500-$600 thousand/year
- Locks and Dams have finite life
- Best fish passage solution considering:
  - Water supply
  - Recreation
  - Commercial and recreation fishing

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# General Reevaluation Report

- **Locks and Dams Issues:**
  - Can not compromise water supply
  - Stability of the locks and dams
  - Potential for commercial use of the locks
  - Spawning areas for anadromous fish
  - Future ownership of the locks and dams and recreation areas

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# Fish Passage Alternatives

- **Fish passage at Locks and Dams:**
  - **No Action – Continue locking only**
  - **Passage does not require deauthorization**
    - **Continue locking**
    - **Nature-like fish way**
    - **Diversion rock rapids**
    - **Rock rapids the entire dow of the dam**
      - **Highest probability of successful fish passage**

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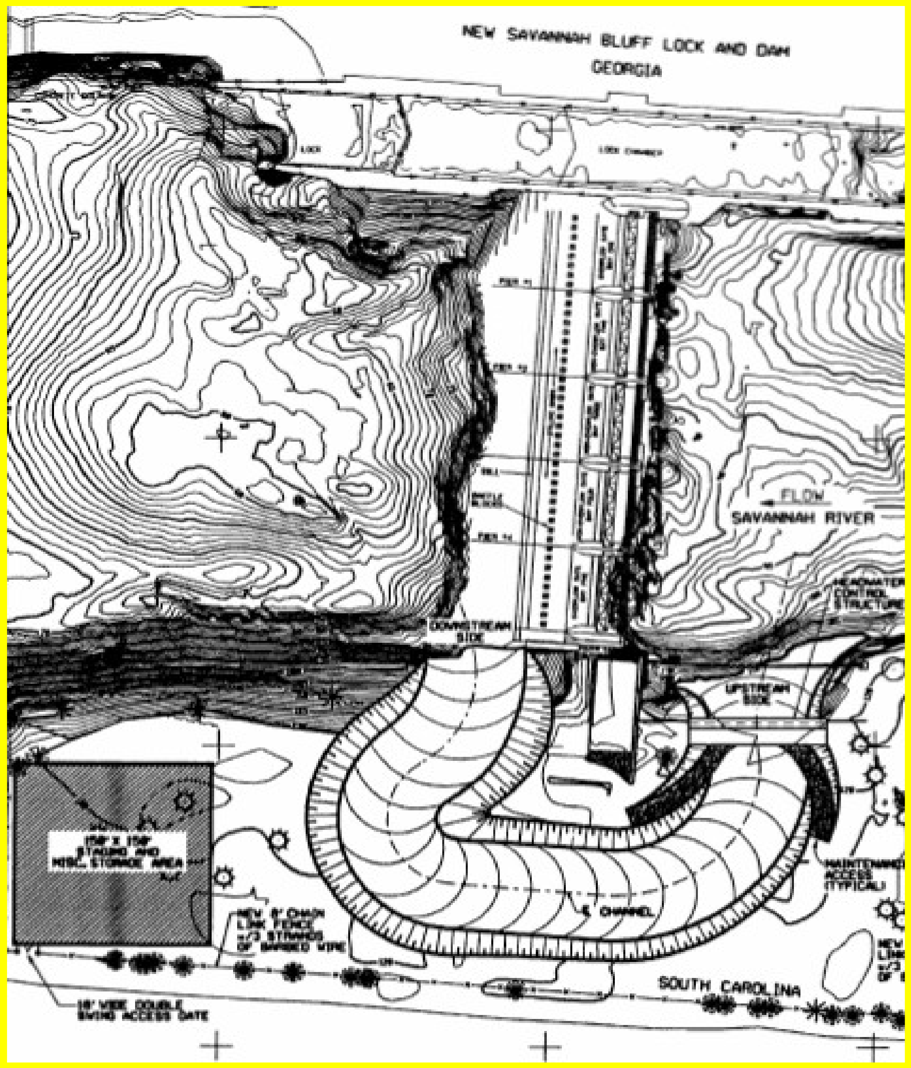
# Diversion Rock Rapids

## New Savannah Bluff L&D


NEW SAVANNAH BLUFF LOCK AND DAM
GEORGIA
LOCK
LOCK CHAMBER
FLOW
SAVANNAH RIVER
HEADWATER CONTROL STRUCTURE
DOWNSTREAM SIDE
UPSTREAM SIDE
150' X 150' STAGING AND MISC. STORAGE AREA
NEW 8' CHAIN LINK FENCE W/3 STRANDS OF BARBED WIRE
MAINTENANCE ACCESS (TYPICAL)
℄ CHANNEL
16' WIDE DOUBLE SWING ACCESS GATE
SOUTH CAROLINA

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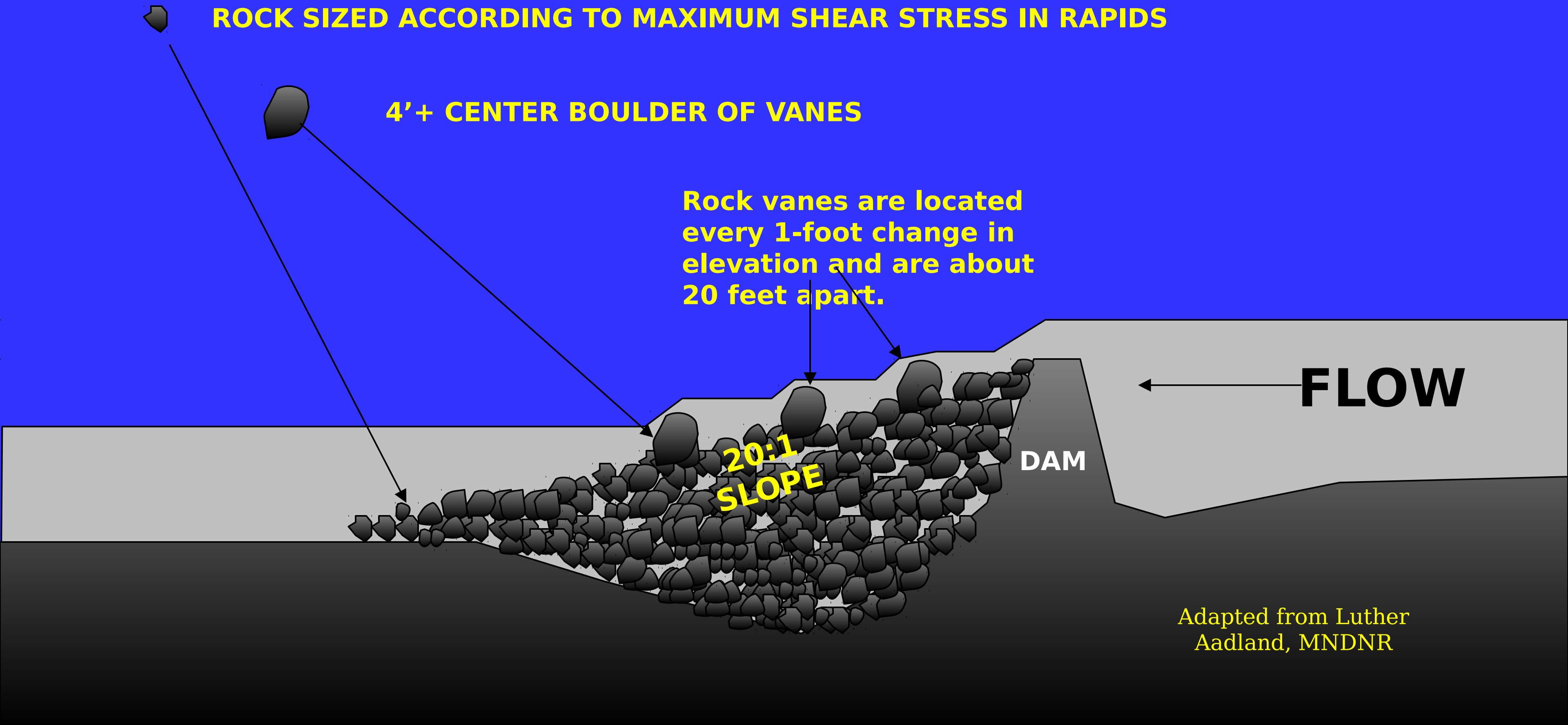
# Rock Arch Rapids

## LONGITUDINAL PROFILE



ROCK SIZED ACCORDING TO MAXIMUM SHEAR STRESS IN RAPIDS

4'+ CENTER BOULDER OF VANES

Rock vanes are located every 1-foot change in elevation and are about 20 feet apart.

Adapted from Luther Aadland, MNDNR

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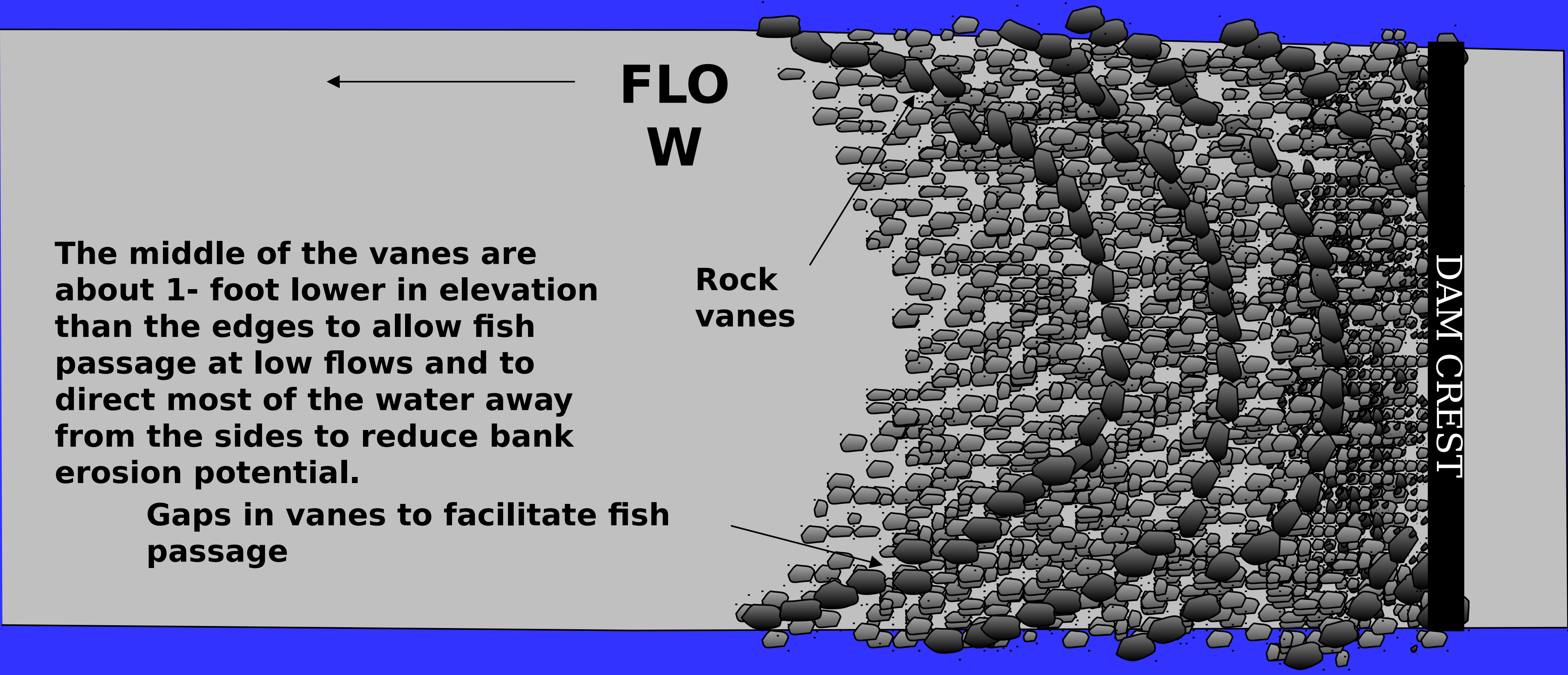
# Rock Arch Rapids



**The middle of the vanes are about 1- foot lower in elevation than the edges to allow fish passage at low flows and to direct most of the water away from the sides to reduce bank erosion potential.**

**Gaps in vanes to facilitate fish passage**

Adapted from Luther Aadland, MNDNR

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# Rock Arch Rapids
# Red River, Fargo, ND

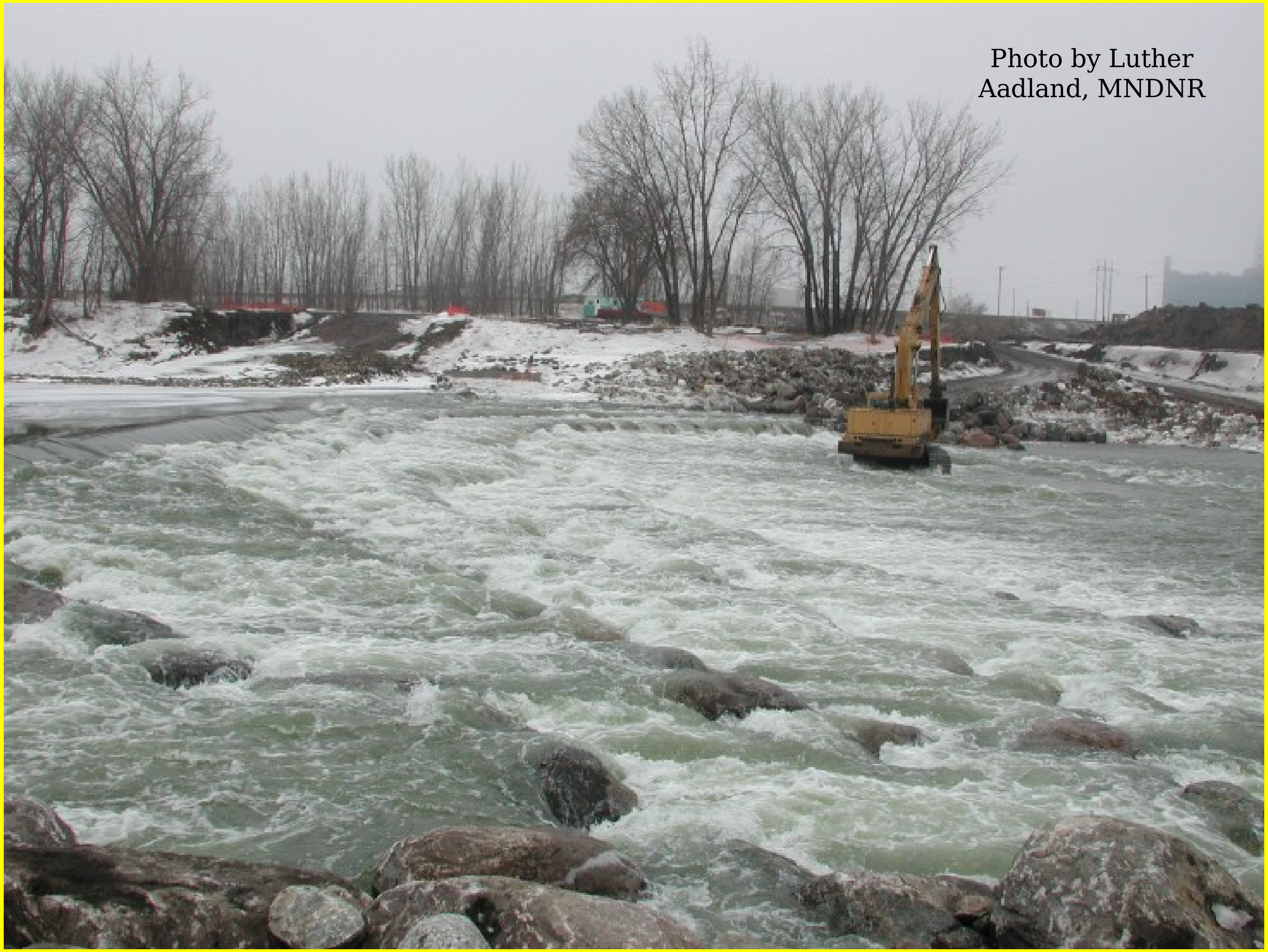

Photo by Luther Aadland, MNDNR

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# Rock Arch Rapids
# Red River, Fargo, ND

ST. PAUL DISTRICT ESSAYONS US ARMY CORPS OF ENGINEERS

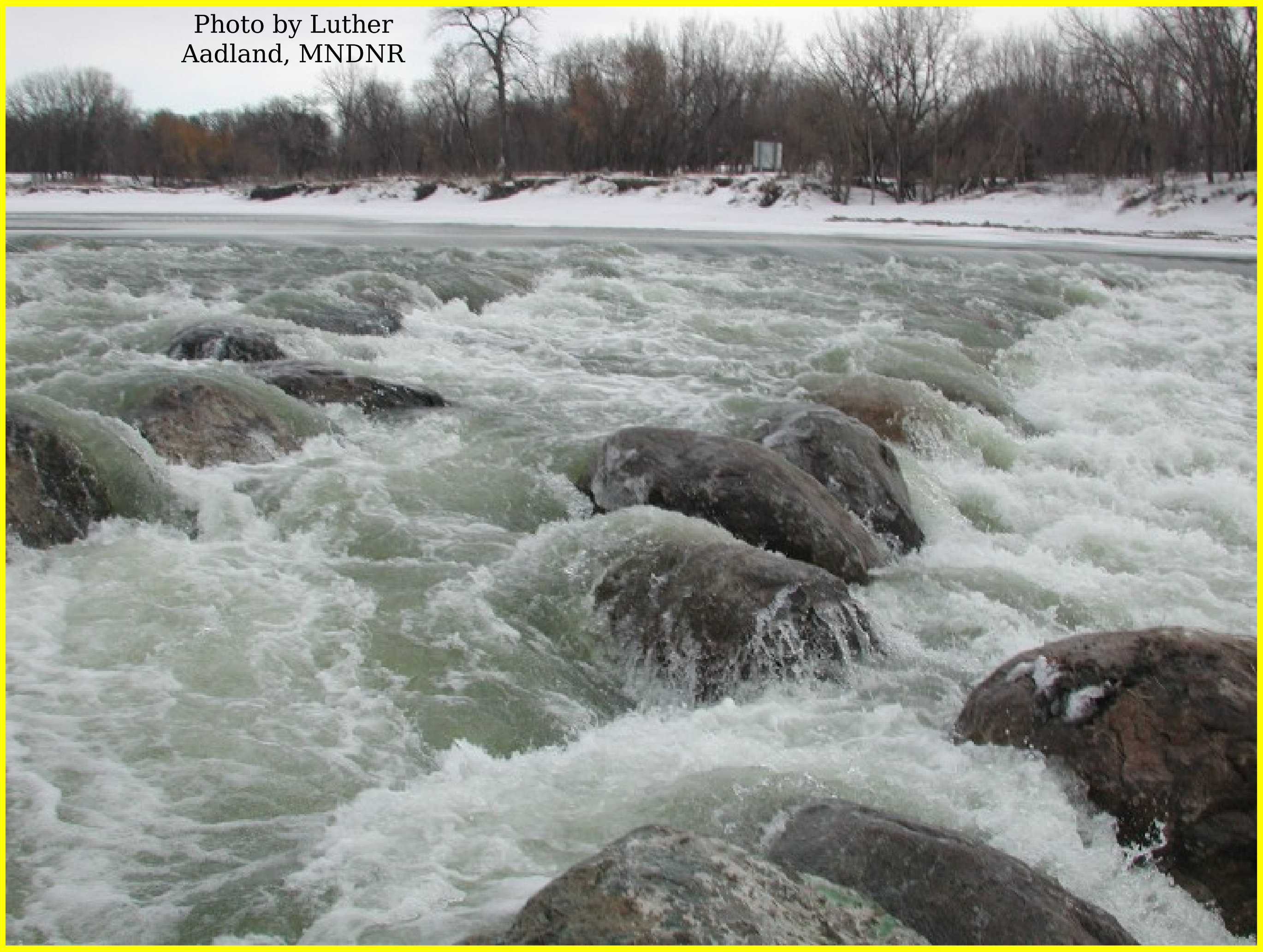

Photo by Luther Aadland, MNDNR

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# Riverside Dam

ST. PAUL DISTRICT
ESSAYONS
US ARMY CORPS OF ENGINEERS

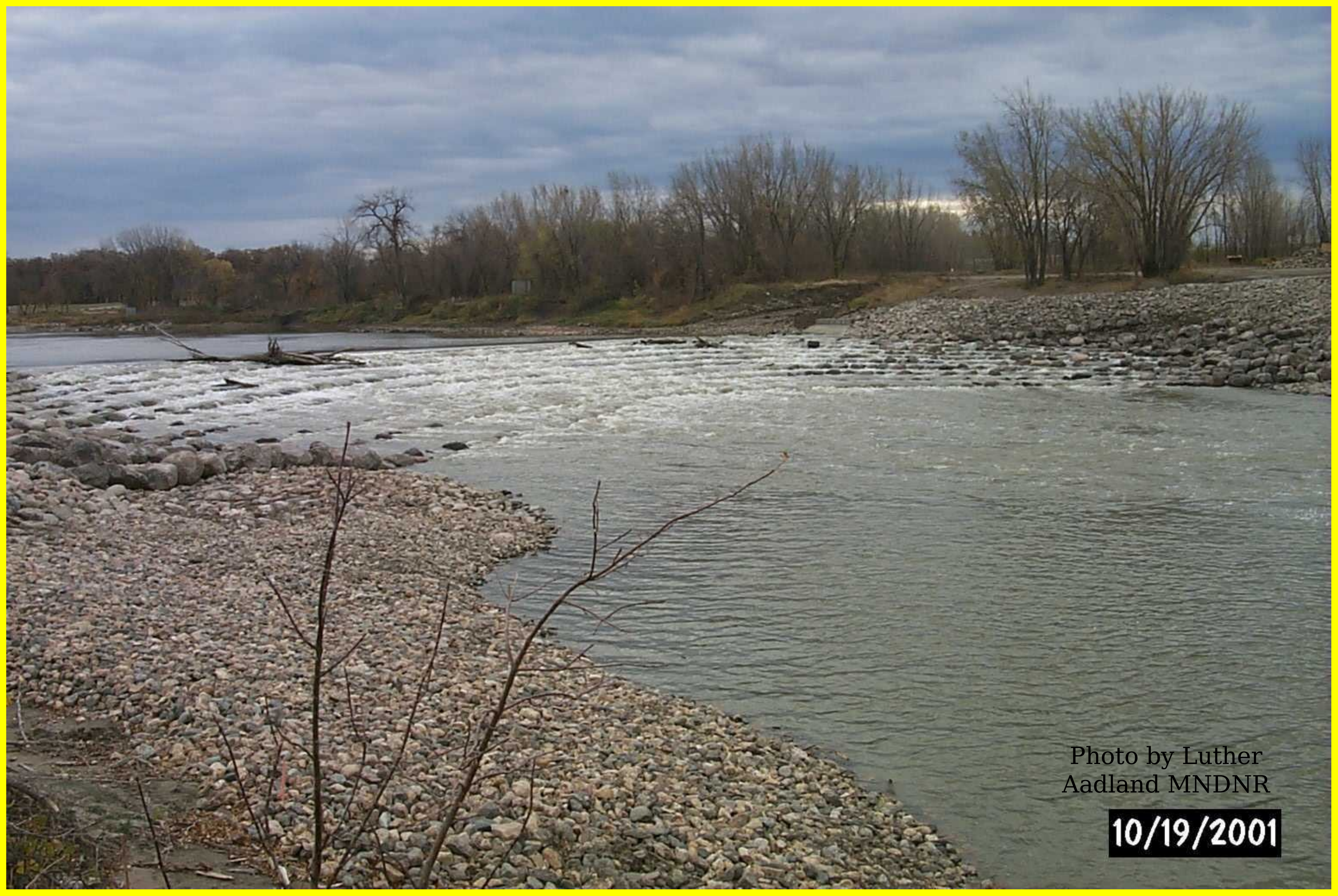

Photo by Luther
Aadland MNDNR

10/19/2001

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# Fish Passage

- **Fish passage at Locks and Dams:**
  - **Does not require deauthorizati**
  - **Requires deauthorization**
    - **Rock rapids in lock chambe**
    - **Lower or remove the dam**
      - **Extensive impact to water supply**
  - **Regardless of fish passage design, deauthorization may be required due to lack of Federal interest**
    - **No navigation**

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# Preferred Fish Passage Alternatives

- Extensive coordination with all interested parties
  - Interagency team
  - Monthly meetings
- Completing stability analysis of Locks and Dams
- Updating costs for all alternatives
- Rock rapids downstream of the dams
  - Preferred alternative at all three locks and dams
  - No impact to existing water users

# General Reevaluation Report (GRR)

## Milestone Schedule

- Alternative Formulation briefing 4 October 2007
- Draft report late summer 2008
- Final report winter of 2009
- Make recommendations spring 2009. May require Congressional approval to implement

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# General Reevaluation Report (GRR)

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***WILMINGTON HARBOR***

***GENERAL REEVALUATION REPORT***

**http://www.saw.usace.army.mil/wilmington-harbor/GRR/GR**